

RECYCLING AND RESOURCE RECOVERY PLAN

FY 2020 UPDATE



CITY OF SAN ANTONIO
**SOLID WASTE MANAGEMENT
DEPARTMENT**

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Message from the Director



San Antonio's continued growth brings tremendous opportunities but also a unique set of challenges. One of the most critical issues to consider is not just maintaining, but increasing the City's sustainability efforts. The effective and innovative management of solid waste and related environmental issues are enormous components of the overall sustainability equation of San Antonio's future.

In 2010, the Solid Waste Management Department (SWMD) developed a road map known as the Recycling and Resource Recovery Plan. It was entitled *A Pathway to Zero Waste*. The intent was not to create a clever headline, but to clearly state the authentic goal of the body of work. City Council approved the plan and the strategies laid out within it moved into tactical execution. The plan was updated in 2013, highlighting progress but also new challenges and re-presented to City Council.

Here we are one decade later in 2020. Where do we stand? How close are we to reaching our strategic goals? Are the action plans and initiatives working? I invite you to keep reading.

Adopted 2010 Goals

The original plan had three main goals, and two of them have been achieved.

1. Ensure that all residents of multi-family structures have access to convenient recycling. **COMPLETE.** Periodic inspections show 97% of properties are in compliance. More information is on page 6.
2. Improve recycling opportunities for local businesses. **COMPLETE.** The SWMD created a commercial recycling assistance and recognition program branded ReWorksSA. Program highlights are found on page 7.
3. Recycle 60% by the year 2025 (timeline amended in 2013). **IN PROGRESS.** We ended FY 2019 with a 35.8% rate and continue to strive to attain the goal, though it's becoming increasingly difficult.

The Goal Still in Progress

Reaching a 60% recycling rate by 2025 is the wheel with many spokes. The majority of this report is devoted to that initiative since it has the most elements to consider. Although covered in more detail in following sections, as an overview, the major proposed strategies and their status are:

- Automation – Complete
- Brush Recycling – Complete
- Variable Pricing or Pay as You Throw (The Cart Downsizing Program) – Complete
- The Organics Program – Ongoing
- Education and Outreach - Ongoing



Message from the Director

Matured Strategies

From 2008 to 2011, with the addition of new trucks equipped with a mechanical arm to lift the garbage cart, the Department transitioned to automated collections which now only required a one-man crew. More resources became available to devote to the recycling program. Automation led to a direct improvement in the recycle rate. Also, many SWMD workers were deployed to the expanded Brush and Bulky Division. Starting in 2011, the City now had ample resources to begin separate collections for organic brush and bulky materials - twice per year for each. This separation allowed the City to recycle the brush into mulch and the tonnage increased the recycling rate.

Evergreen Strategies

In FY 2012, the SWMD introduced the Organics Program, a combined yard waste and food waste pilot program, to 30,000 residents. In 2017, all SWMD customers had the green cart and at the end of FY 2019, over 68,000 tons of organic material was collected and composted, not landfilled (see page 11). The Cart Downsizing Program also continues to gain momentum with more customers converting to the medium and small sizes of brown trash carts. The incentive is a cost savings for them with an expected outcome for the SWMD that their participation in the recycling (blue cart) and organics (green cart) participation will have to increase. Additionally, the Department's Outreach and Education Program continues to improve and innovate by reaching new audiences, utilizing the latest marketing and advertising best practices, and deploying award-winning campaigns.

Challenges to this Goal

The City's recycling rate goal can be easily misunderstood, mainly because it is not Citywide in scope. The SWMD does not provide collection to gated communities, apartments, or businesses and so any recycling from those sectors is not calculated. The recycling rate detailed in this report measures only the behaviors of approximately 359,000 SWMD residential households.

Perhaps it would be better to call it a diversion rate – a measurement of everything that we touch that does not go to the landfill collected from blue recycling carts, green organics carts, brush materials, and even tires.

Another challenge is a major upheaval in the manufacturing and recycling industries. For years, recycling materials have been getting steadily lighter. Unfortunately, our recycling rate is a weight-based measurement. As plastic bottles, for example, and other recyclable items have gotten lighter (but still take up the same amount of space), it is increasingly more difficult to reach a goal that is based on heft. Additionally, the composition of recyclables has changed. As an example, ten years ago newsprint, which is very heavy, made up a large commodity of recycling. Today in the digital age, there is much less of it. The recycling rate also does not portray environmental benefits or adequately capture progress toward increased diversion. The SWMD still believes it is an important goal but tracking simultaneously, we are exploring other performance metrics that when all combined will render a more complete evaluation.

A Literal Deep Dive into the Situation

In FY 2019, the SWMD conducted the City's first waste characterization study. That's a fancy way of saying we hand sorted through 24 tons of garbage. Our customers are putting significant amounts of recyclable and organic material in their brown trash cart and ultimately off to the landfill. With an extreme level of change in customer behavior, we found that a 60% recycling rate is indeed possible. However, by extreme, I mean that every individual household would need to sort every single item perfectly correct 100% of the time.

Message from the Director

Improvement is always possible, but we are confronted with the reality that this level of sustained adherence to flawless recycling may not be attainable. The complete Waste Characterization Study can be found at www.sanantonio.gov/swmd.

Future Vision

In 2019, the City approved a Climate Action and Adaptation Plan. This Resource Recycling and Recovery Plan from the Solid Waste Management Department is one of the tools the City can rely on to address climate change and specifically to help reduce greenhouse gas emissions. As one great example, we have recently added six hybrid diesel-electric trucks to our fleet. These vehicles get 22% better fuel mileage. We plan to continue to research cleaner and more efficient vehicle technologies. Additionally, all fleet passenger vehicles and small trucks will convert to more efficient options by 2025 with a priority on electrification. In addition to vehicles, other heavy equipment will include technology to reduce emissions such as our new tub grinder for brush and mulch operations that is electric, not diesel.

A Pathway to Zero Waste

The following pages cover milestones reached, data analyzed and the strategic priorities remaining. I would also like to underscore that when we use words like 'complete', 'matured' or 'achieved' throughout this report, that does not mean we are finished. We are continuing to improve upon the progress made on every initiative referenced here. This is our commitment to San Antonio's continued sustainability.

Best regards,



David Newman
Director

City of San Antonio Solid Waste Management Department



Multi-Family Goal - Completed

Ensure All Multi-Family Residents Have Access to Convenient Recycling

On December 9, 2010, City Council passed an ordinance requiring all apartments and other multi-family housing (MFH) structures to offer recycling to their occupants. The SWMD does not offer collection at these properties, but does provide technical assistance to help them develop a program. Almost a decade since the implementation, we consider this a mature program that is working well. The SWMD conducts regular inspections at multi-family properties and 97% of them are in compliance with the ordinance.

The most common issue for non-compliance at property level is signage. By ordinance, MFHs must provide clear and visible signage on recycling containers stating what is accepted in the program. Properties typically do not own these recycling containers. They are supplied by the private hauling company and therefore property owners and managers rely on their hauler for proper labeling. The SWMD is considering several organizational program changes that would address this (page 19).

The second most frequent violation is overflowing recycling containers. The SWMD has a capacity calculator at www.sanantonio.gov/swmd that recommends the optimum size of recycling container a property should have based on several criteria. However, it is only a recommendation and not a requirement. The SWMD will continue to research best practices on capacity and may recommend a mandatory minimum recycling capacity in the future.

Waste haulers submit an annual report on their multi-family recycling activities. There are plans to develop a broader survey for them to report all their recycling activities to the SWMD. This additional data from their entire recycling operations will help the Department build new programs in commercial and MFH recycling.



Commercial Goal - Completed

Improve Recycling Opportunities for Businesses

The SWMD does not provide collection services to commercial businesses. However, the Department launched ReWorksSA in February 2019 to assist local businesses with creating or improving a recycling program in the workplace. There are four major components to this program, all working successfully and therefore no significant changes are planned at this time.

1. Consultations: Onsite consultations at no charge to help businesses measure the type and quantity of waste they generate followed by strategic discussions on customized recycling plans.
2. Certification and Recognition: Businesses receive points by implementing sustainability best-practices and can attain a Bronze, Silver or Gold Certification by the City of San Antonio. At the end of FY 2019 there were 21 Bronze, 29 Silver, and 25 Gold organizations.
3. www.reworkssa.org: This robust website features interactive tools to help businesses connect with recycling providers, create recycling signs, and apply for certification. It is only one of many marketing tactics of promoting the ReWorksSA brand.
4. No-Cost Recycling Containers: ReWorkSA provides a limited number of recycling and/or organics bins to small and mid-size San Antonio businesses. Overhead expense is a key obstacle, especially to small businesses, to recycle and this program policy has proven extremely beneficial.



Residential Goal - In Progress

Recycle 60% of the Single-Family Residential Waste by 2025

Recycling Rate

The 60% recycling goal was modified in 2013 to extend the timeline to 2025 from the original goal of 60% by 2020. As previously stated, the goal is based on SWMD residential households that receive curbside collection services. Recycling from commercial locations, gated communities, and apartments is not tracked and therefore not included. It is a measurement of everything the SWMD collects that does not go to the landfill from blue recycling carts, green organics carts, and brush materials from total tonnage collected from all sources.

At the end of FY 2019, the recycling rate was 35.8%. Starting in FY 2020, the recycling rate would need to increase by 4% every year in order to reach the 60% by the year 2025.

Recycling Rate =
$$\frac{\text{Green Cart} + \text{Blue Cart} + \text{Brush}}{\text{Landfilled} + \text{Green Cart} + \text{Blue Cart} + \text{Brush} + \text{Other Recycling}}$$

Graph 1: Recycling Rate Growth - Actual, Projected, and Required

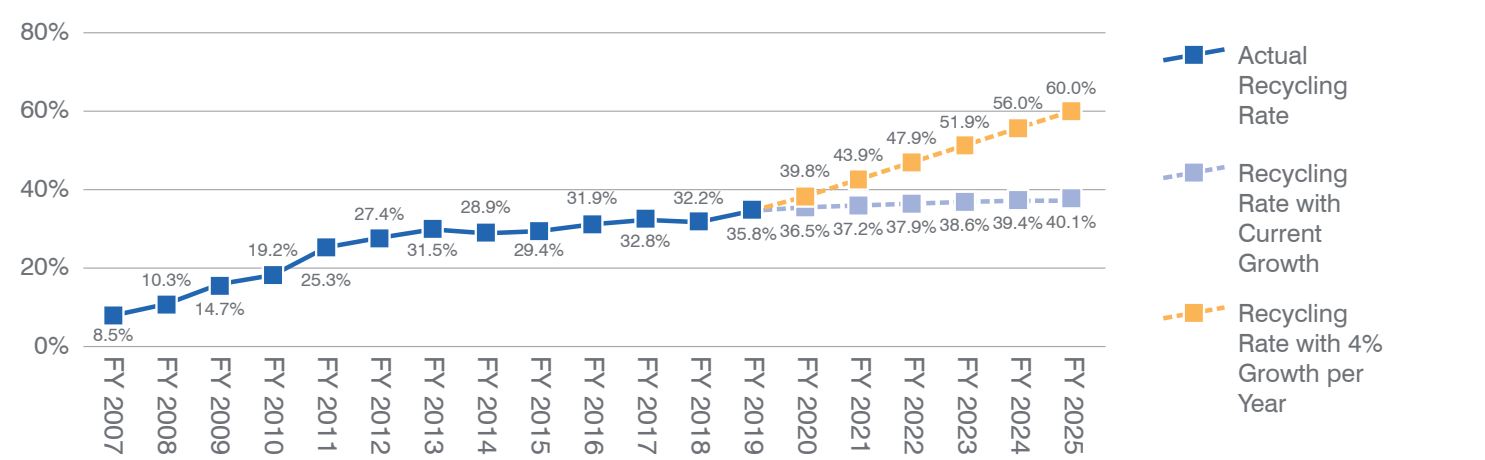


Table 1: Recycling Rate by Program

Program	Tons	Percent	
Blue Cart Recycling	60,273	10.2%	35.8% Recycling Rate
Green Cart Recycling	50,509	8.5%	
Brush Recycling	99,743	16.9%	
Other Recycling	1,173	0.2%	
Landfilled	379,796	64.2%	
Total Collected	591,494	100%	

Residential Goal - In Progress

Brown Cart Garbage Collection

Weekly collection of garbage from the customers' brown carts is the fundamental core service of the SWMD and it is also the only cart of the three options that the City charges for. In 2015, the Department developed and implemented a variable rate pricing program for the brown garbage cart. Residents choose from three different brown garbage cart size options. The smaller cart size they select, the smaller monthly fee they are charged. The goal was to incentivize residents to downsize to a smaller capacity brown cart and, in order to do that, increase their use of the blue recycling and green organics carts, requiring less space in the brown cart. This would increase diversion of recyclable and organic material from the garbage stream. Those who recycle and divert waste from the landfills are rewarded with a lower solid waste fee.

The initial rate difference was \$1.75 between the largest (96-gallon) to the smallest (48-gallon). The price differential was not compelling enough and the SWMD did not meet the target for customer downsizing. That was, however, cautiously regarded as not failing a performance measure. There was a real concern, and continues to be, about people switching too quickly just for the savings without improving their correct recycling participation. As described on page 15, contamination plays a significant barrier in the recycling program and so a watch-and-measure policy provided some balance to the initiative.

The Department has been promoting this program through broad reaching advertising campaigns since 2018. The SWMD also completed extensive market focus-group research on customer behaviors in 2019. Although from a technical definition it is a variable pricing program, it is marketed to the public as Cart Downsizing.



Residential Goal - In Progress

Table 2: Price Differential Increases

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Small, 48-G	\$18.19	\$18.19	\$17.69	\$16.76	\$ 16.50
Medium, 64-G	\$18.69	\$18.69	\$19.69	\$18.76	\$ 20.50
Large, 96-G	\$19.94	\$19.94	\$22.44	\$26.76	\$ 28.50
Small to Large Difference	\$1.75	\$1.75	\$4.75	\$10.00	\$ 12.00
Ratio from Small to Large Cart	10%	10%	27%	60%	73%

Table 3: Cart Downsize Increases

Cart Size	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020 YTD ²
Small, 48-G	3%	3%	4.6%	9.5%	11.1%
Medium, 64-G	2%	2%	2.6%	5.5%	6.8%
Large, 96-G	95%	95%	92.8%	85%	82.1%

Blue Cart Recycling Collection

Because the SWMD does not charge customers for collecting the blue cart in no way implies this program is cost-free. Historically, contracts between a municipality and a private recycling contractor have involved a low processing fee which does not cover the cost of operations. The contractor sells the recycling commodities at a profit and that revenue is used to cover operating expenses. Revenues from the sale of commodities are often shared with municipalities. The SWMD's current contract follows that model but is scheduled to expire in 2024. The international recycling economy is undergoing drastic changes and future contracts are expected to be more expensive and structured differently.

Recyclable materials are commodities that are bought and sold in the international market. For many decades China has been the main buyer of recyclables, not just from the United States, but worldwide. In 2017, China began to implement strict quality control measures for incoming recycling shipments. Most recycling facilities were not able, and continue to be unable, to meet those standards. Thus, prices for these commodities have plummeted greatly.

In FY 2019, recycling cost the City about \$9.42 per ton after the revenue share. Though that price is still cheaper than the average landfill rate of \$25.38 per ton, the Department is researching methods to help mitigate those costs even further. These may include: (i.) targeted campaigns on high value commodities like aluminum cans and milk jugs; (ii.) change in the program materials accepted; (iii.) an increased focus on reducing contamination; (iv.) new types of partnerships with our future contractors, and; (v.) researching alternative processing technologies.

Table 4: Sample Recycling Contract Prices

City	Per Ton Processing Cost	Year Signed
San Antonio	\$48.76	2016
Houston	\$87.05	2019
Dallas	\$70.84	2015
New Braunfels	\$91.00	2019

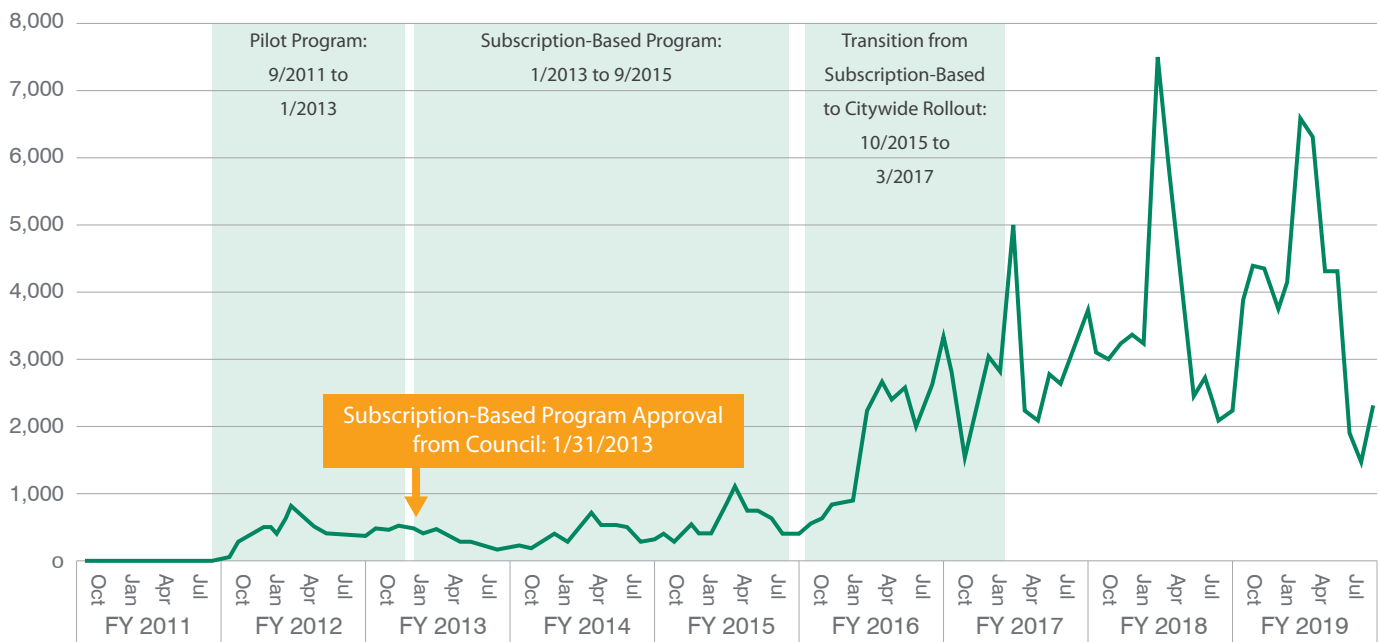
¹ As of March 2020

Residential Goal - In Progress

Green Cart Organic Collection

In 2012, the SWMD implemented a pilot program for curbside collection of organic material for 30,000 customers. In 2013, an optional fee-based subscription program was implemented Citywide. The cost for this program was later included with base monthly fees and the program was made available to all customers at no additional charge in 2017. This has become a popular program with high participation. As Graph 2 shows, it is also a seasonal program driven by the natural growing season of trees, grass, shrubs, and the South Texas heat. The overall potential of the program though is diminished somewhat by limitations of processing technology and contamination (refer to page 15).

Graph 2: Organic Tons Collected FY 2011- FY 2019



Brush Curbside Collection and Drop-Off Centers

In 2011, the SWMD required residents to separate brush piles from bulky materials for curbside collection. This separation allowed the Department to recycle significant amounts of brush that were previously landfilled while mixed with bulky items. The Department continues to provide every customer brush collection twice per year. In 2012 a second brush drop-off center was opened at the closed Nelson Gardens Landfill. A small fee is charged to both residents and commercial customers to dispose of brush and other yard waste at the drop-off centers. In FY 2019, 16.9% of the recycling rate was attributed to organic brush material.

The Department also provides curbside bulky collection twice per year for every customer. In addition, the SWMD operates four drop-off centers for bulky materials where residents may discard select unwanted materials at no charge. A limited number of items from bulky collections can be recycled. These include cardboard, scrap metal, appliances, tires, and televisions. Both the demand and feasibility of recycling other bulky items continue to be explored by the SWMD.



Supporting the Goal

Diversity in Outreach and Education

Outreach and Education remains one of the most effective programs to improve the quality and quantity of recycling in San Antonio. In 2014, the SWMD hired two community recycling coordinators, which was a first and essentially created the program. The Department now has four full-time recycling coordinators, and in FY 2019 this team provided over 1,100 presentations in schools and at community groups, reaching tens of thousands of City residents. (There are two additional recycling coordinators devoted to only commercial organizations.) Innovations for FY 2020 and beyond include hosting mobile “pop-up” recycling events, bringing the education directly into City neighborhoods. Character recognition is a proven method of retention, especially for children, and the team has developed Curby (blue cart), Glenda (green cart) and Bart (brown cart). Among other promotional activities of these mascots, the Department applied them to large inflatables to attract attention, especially in the City’s Fiesta parades.

By analyzing socioeconomic and demographic data in San Antonio to identify populations that have previously been underserved by SWMD recycling messages, the Outreach and Education Program has a keen focus on equity. One example would be multi-language digital campaigns in languages other than English and Spanish to reach new audiences, specifically the City’s large Middle Eastern culture. So far, videos about cart downsizing have been created in Hindi, Urdu, Punjabi, Gujarati, and Marathi languages. Also, in 2019 the first ever set of recycling presentations for the homeschool community was organized to great success. These will become annual events. The team has also established a partnership with the Lighthouse for the Blind to create educational materials in Braille.

The Department also continues to promote broad-reaching marketing campaigns across traditional media, (radio, television, billboards, and VIA bus advertising) digital media (internet-delivered programming) and social media channels. The SWMD has enhanced its mobile app, Recycle Coach and uses other innovative marketing tactics such as in-theater advertising and in-game promotions with the SPURS and UTSA.



Economic Development

The City of San Antonio has no direct involvement with buyers of recyclable materials. Other cities such as Austin, Denver, and Phoenix are trying to promote eco-centers where recycling can be used within the same city that generates it. The SWMD will research potential partnerships and infrastructure needs to promote a local circular economy. Transportation is a significant cost in the final profitability of recycling commodities. Attracting manufacturers to the region that will ultimately use the recycling commodities will be beneficial to both the local job market as well as the profitability of recycling.

Technology

In the recycling industry there have been many technological advances that, if implemented at the SWMD could both enhance work productivity and support the goal of a higher recycling rate. Two examples already in place are the Recycle Coach app that residents can download for free and the Mobile Epiphany app used by the inspectors. Robots with artificial intelligence are now being used in both the recycling and organics industries to remove contamination. The Department is working toward incorporating this innovation into the organics program as early as the first quarter of 2021 through a new contract for organics processing. The priority will be a significant increase to diversion while reducing contamination and rejected loads. Other innovations being researched include:

- Chemical or advanced recycling uses heat and chemicals to convert plastic back to the original components.
- Machines known as “anaerobic digesters” convert food into liquid fertilizer faster than compost.
- Refuse derived fuel (RDF) and solid recovered fuel (SRF) are being used by manufacturers with high energy needs such as cement kilns.
- Expanded uses for commodities - asphalt mix partially made from plastic bottles and crushed glass as aggregate in concrete, for example.
- Artificial intelligence in the inspection process.



Challenges to the Goal

Recycling Stream Composition

Because the recycling rate is weight-based, it is affected by the type of materials processed. Heavier recyclables such as glass will increase the recycling rate. Unfortunately for this goal, packaging has increasingly transitioned to lighter plastic – which is not always recyclable. For example, coffee used to come in a heavy metal container that was fully recyclable. Coffee later was packaged in a much lighter plastic container that was still recyclable. Today, coffee is usually sold in a light weight foil or paper pouch which is not recyclable.



High Weight
Recyclable



Medium Weight
Recyclable

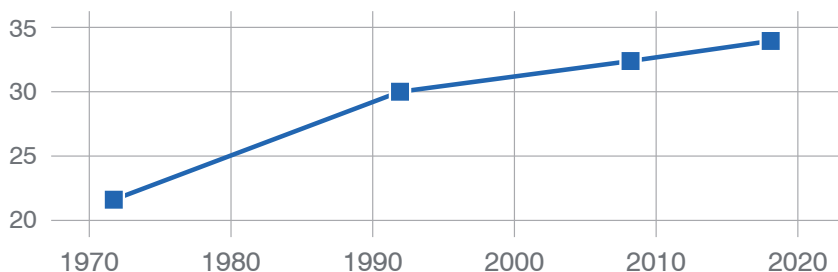


Light Weight
Non-Recyclable

Light Weighting

In this coffee example, the packaging was completely changed. However, for many products, packaging still looks unchanged for brand fidelity but can weigh significantly less. In 2019, about 4,000 more aluminum cans were recycled in the City's program over 2008, but the weight of those aluminum cans was actually lower. Manufacturers have been reducing the weight of packaging as seen in the graph below for aluminum cans. Similar light weighting is being applied to water bottles, soda containers, and a variety of other household items.

Graph 3: Number of Aluminum Cans to Equal One Pound, 1970 - 2020



Food Waste Participation

The City's organics pilot program began in 2011. During that roll-out, SWMD staff personally visited 30,000 households and delivered free kitchen bins for collecting food scraps. Additionally, instructional literature was developed on best practices for placing food in the green cart. Seasonal reminders about composting food waste were also mailed. Although 'outdoor' organics participation such as leaves, grass and yard clippings was high, during the pilot's timeframe, 2011 through 2013, less than 1% of green cart material was actually food waste. Even more recently, an additional analysis of green cart material revealed that still only less than 1% was food waste. However, by contrast, the waste characterization study referenced on page 4 documented that

Challenges to the Goal

approximately 25% of material disposed of in the brown cart was food waste, proving there is great potential for diverting more organic material (food) from the landfill with diligent and focused customer engagement. This reluctance to place loose food in a composting cart is seen across the country. In 2014, the amount of food found in Seattle's brown cart which has a much longer composting history than the SWMD was 28% which prompted that city to implement a mandatory composting law in 2015. There have been multiple court challenges to that ordinance, so the effect is unknown at this time.

Contamination

Contamination refers to items that are placed in the blue or green cart, but are not processed into recycling or compost. Contamination has three sources: (i.) items that should never have been placed in the cart to begin with; (ii.) items that were improperly prepared, such as cans with food remaining inside, and; (iii.) items too small to be processed.

In the blue cart, most contamination can be sorted out but this incurs considerable costs. Under the current recycling contract, San Antonio pays a financial penalty when contamination exceeds 15%. Currently, in the green cart, the City's contractor is unable, and perhaps unwilling, to remove contamination. Entire loads of organic material can be rejected for as little as 5% contamination meaning that as much as 95% of good organic material still goes to the landfill.

The Department's inspections program is a vital tactic in reducing contamination. There are currently 32 inspectors that perform a variety of functions, including inspections of carts, billing verification, facility inspections, and audits. In 2017, right hand drive jeeps were purchased for most of the inspectors. This increased efficiency by not having to leave the vehicle to inspect a cart. Cart inspections increased from twice per year to six times per year per customer.

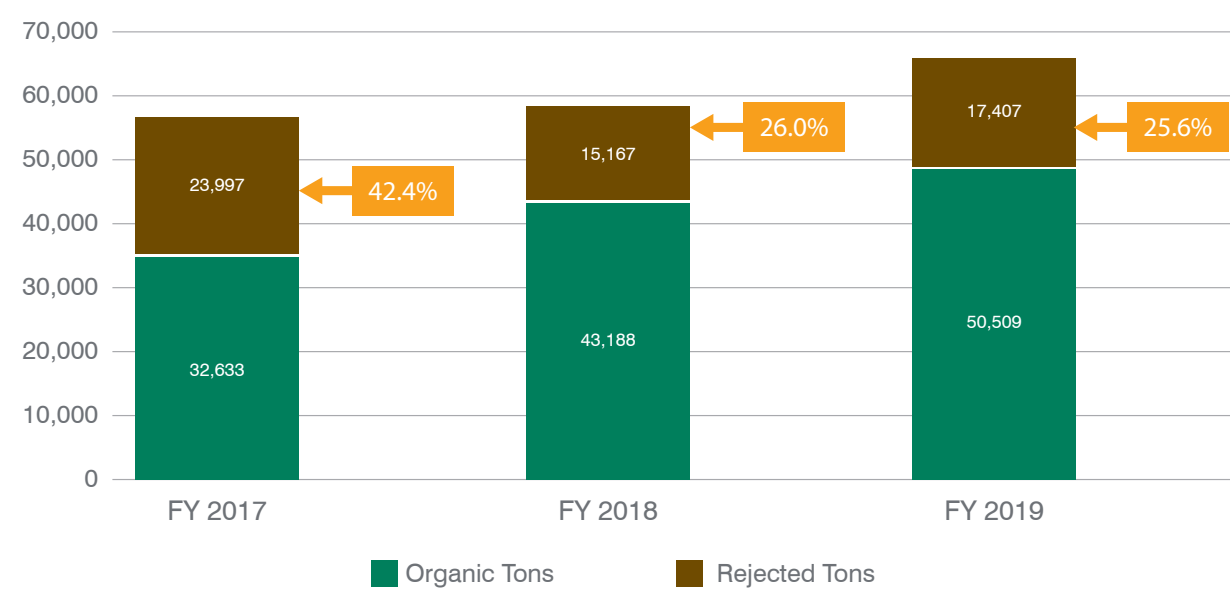
Inspectors also have an active role in direct customer engagement. For example, carts with small mistakes receive a friendly reminder or "oops" tag with instructions on how to correct the violation. After multiple violations, a formal warning tag is left on the cart. A follow-up letter with photographs is then mailed. Further violations may result in a financial penalty. Multiple violations may also result in the cart being removed altogether. The goal of this penalty structure is not financial profit but rather an incentive to increase compliance. In fact, a resident



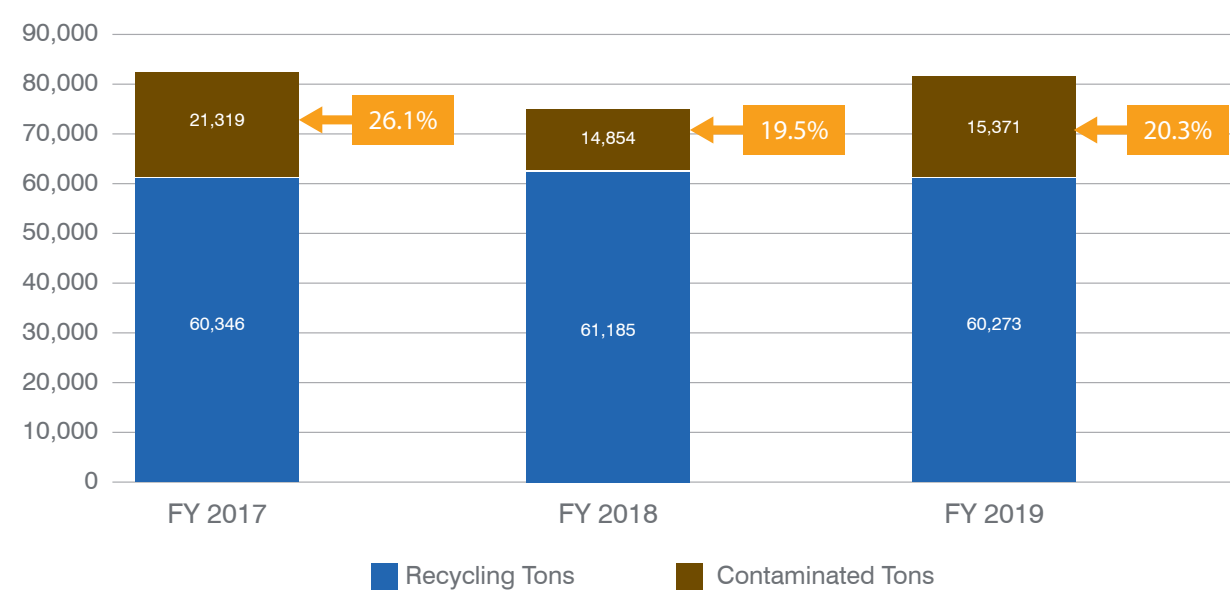
Challenges to the Goal

may receive a waiver of the financial penalty by completing a simple online recycle training course. Much like defensive driving, the person watches recycling videos and then successfully completes an online quiz.

Graph 4: Organics Program Tons Recovered, Rejected, and Rejection Rate



Graph 5: Recycling Program Tons Collected and Contamination Rate



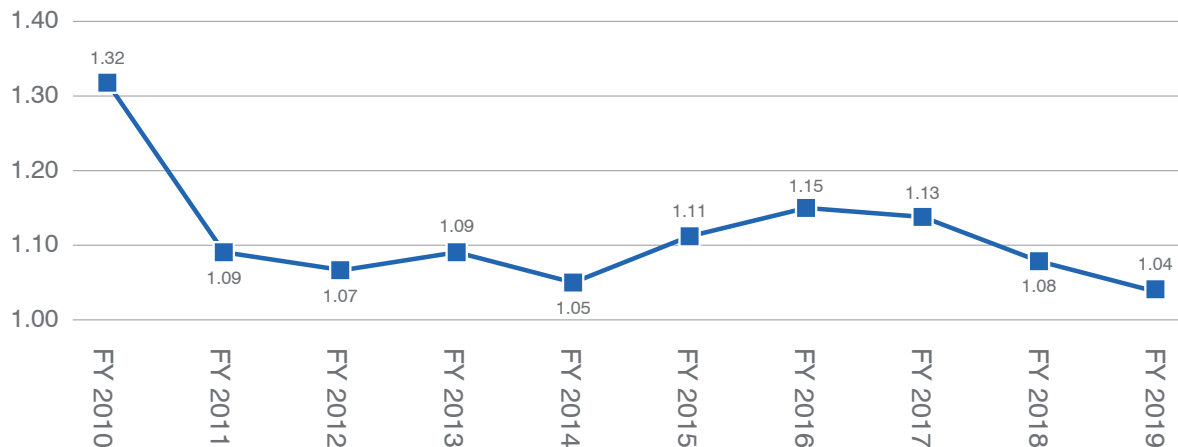
Alternative Performance Measures

The Department has been researching performance metrics that are used by other municipalities. Many of them presented here are complementary to the existing 60% goal.

Landfilled Tons per Capita

This measures tons of material sent to the landfill per customer household. This metric may reveal a correlation between diversion program participation and landfilled material. Graph 6, shows landfilled tons per capita by year.

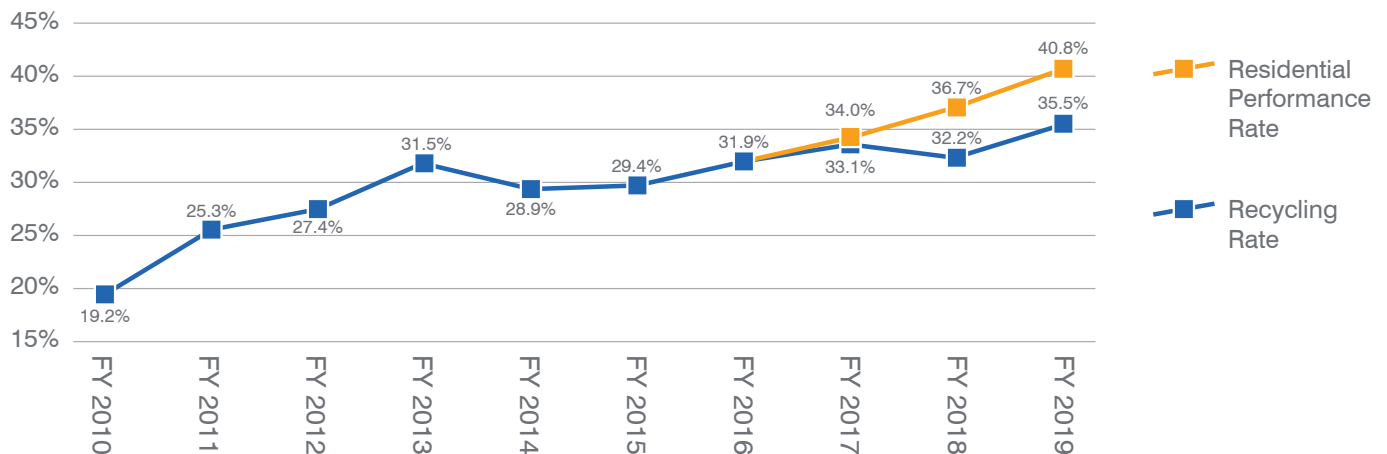
Graph 6: Landfilled Tons per Household



Residential Performance Rate

The residential performance rate measures how much clean materials customers correctly placed in their blue and green recycling cart before it became contaminated through residential or contractor error. Measuring good material lost in the waste stream is determined through audits conducted by the Department. In Graph 7, the residential performance rate is shown in relation to the traditional recycling rate beginning in FY 2017.

Graph 7: Rate Comparisons



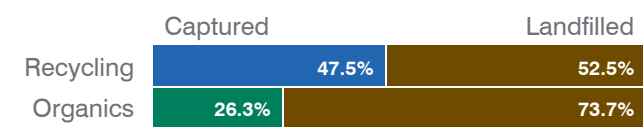
Alternative Performance Measures

Capture Rate

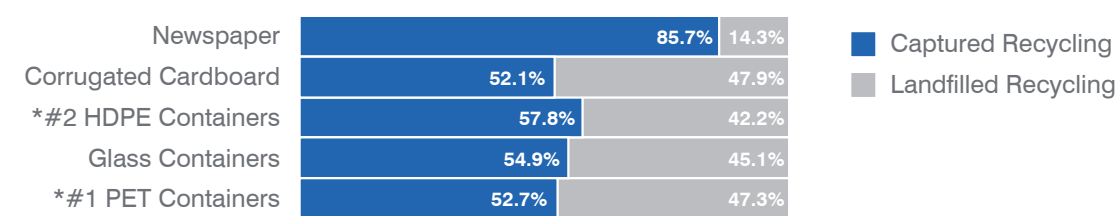
The capture rate shown on Graph 8 measures how much is recovered versus being landfilled. This also identifies the commodities with the greatest recovery potential and is a better indicator of a diversion program’s performance, as shown in Graph 9.

Calculating the capture rate for an entire stream is done by dividing the total recovered tons of a stream by the total recovered tons of the stream plus tons of that same stream landfilled. Using actual FY 2019 tons, the capture rate for recycling was 47.5% and 26.3 % for organics.

Graph 8: FY 2019 Capture Rate



Graph 9: Capture Rate by Commodity



**Soda, water, and juice containers are typically made of PET. Shampoo and detergent containers are typically colored HDPE.*

Volumetric Rate

This measures the rate of diversion using volume in pounds per cubic yard.

Recyclable material is becoming lighter – what the industry calls the ‘evolving ton.’ The same volume of recycling weighs less in tonnage today than before. This shift affects the recycling rate. More material doesn’t necessarily mean more weight which makes a weight-based metric less reliable as a measure for diversion. Using a volumetric rate to track landfilled material will provide the SWMD insights into the amount of landfill space taken up by the City.

The volumetric rate is calculated by: (i.) factoring in truck load ticket data in tons for the first load collected from a route; (ii.) converting those tons into pounds; (iii.) calculating the pounds per cubic yard, and; (iv.) calculating the volume capacity of collection vehicles.

Green House Gas Emissions Metric

A greenhouse gas (GHG) metric, measured in metric tons of carbon dioxide (MTCO₂E), would show the amount of GHG emissions avoided (not produced) through diverting material from the landfill. Landfilling produces GHG emissions in the following ways:

- Recoverable material in the landfill is buried not reused thus more virgin material is mined to produce new goods. This leads to higher GHG emissions over using recycled materials.
- Material decomposition creates methane. While most landfills convert the methane to energy, this still produces a higher amount of CO₂ than recycling.

For the three primary goals of this plan, strategic priorities have been developed and are presented here with sample execution tactics.

Multi-family Goal Strategic Priorities

Improve Program Attributes

1. Conduct research around polices that require organic material collection from multi-family tenants.
2. Implement organizational changes to the program for efficiencies.
 - a. Assist property owners with required signage.
 - b. Align the inspection process with the best practices of the SWMD's existing residential inspection program.
 - c. Focus on complaint resolution.

Commercial Recycling Goal (ReWorksSA) Strategic Priorities

Expand Education and Outreach

1. Explore new Chamber of Commerce opportunities and memberships.
2. Created targeted advertising campaigns.
3. Improve relevant recycling information specific to the business community at www.reworkssa.org.
4. Maintain sustainable relationships within the local business community.

Enhance Informational Resources

1. Conduct additional business stakeholder meetings to evaluate areas for program improvement.
2. Research the feasibility of a Recycling Development Center.

Analyze Reporting Data

1. Implement service frequency and capacity reporting from haulers to determine collected versus landfilled.
2. Use tonnage information from haulers, producers, and processors to determine specific commodities in the collected streams. Create local markets for these commodities to boost local material management industries.
3. Consider incentives or grants for businesses to assist with costs of recycling programs.

Consider Rebate Programs

1. Research other municipalities' financial incentive programs for business solid waste collection services for recycling and organics. For example, set specific price points for organics and recycling with the City paying the difference or offer tax breaks for tracking food donations.



Strategies and Execution

Blue Cart Program Tactics

This program is one of three discussed here that all contribute to the goal of reaching a recycling rate of 60% by 2025.

Expand Education and Outreach

1. Expand educational presentations to schools, community organizations, and other City departments.
2. Emphasize two primary educational points: 1) what can and cannot go in the blue recycling cart and 2) why it matters.
3. Use cart inspectors' and collection drivers' data to map areas with high levels of contamination and then focus marketing and contamination reduction efforts.

Utilize New Technologies

1. Explore technologies that can assess cart contents when dropped into the truck hopper such as artificial intelligence on hopper cameras. Use the data to customize educational materials.
2. Leverage customer engagement technologies available to the SWMD such as the mobile application, Recycle Coach to push reminders about contamination and receive customer feedback.
3. Evaluate the issues with bundled plastic bags. Unbundled bags tangle in the machinery which is labor intensive to remove and poses a safety risk to workers.

Secure Long-term Solutions

1. Cost analysis for building and operating a Materials Recovery Facility (MRF).
2. Feasibility of building and operating a MRF at a pre-selected City-owned and available location.

Research Policies, Incentives and Alternatives

1. Research other City-implemented policies intended to prevent placing recyclables in the garbage cart.
2. Develop regional partnerships for new recycle markets. Scope would include:
 - a. Develop new materials-management inclined business, technologies, and processes.
 - b. Increase relevant businesses creating and assisting in the recycling market.
 - c. Address the need for businesses using recycled material and attract manufacturers to San Antonio.
 - d. Publicize data that shows available material and demand.
 - e. Research infrastructure needs in the regions to process feedstock.
3. Determine the demand for specialized drop-off locations only for certain recyclables such as glass or cardboard.

Commit to Equity

1. Continue to identify the socioeconomic and demographic composition of the City to reveal underserved populations (page 12).
2. Create learning experiences at the neighborhood level (page 12).
3. Identify how the SWMD can improve deploying messages and collecting feedback in non-traditional communication channels (page 12).
4. Through ReWorksSA, the SWMD staff will focus on small and minority-owned businesses to include in the certification program for recycling in the workplace.
5. Continue the 'walk-up service' to eligible customers whereby collection truck drivers retrieve carts from the customer's yard and bring to the curb. Once serviced, they return it to the customer's house.

Reduce Greenhouse Gas Emissions

The organics program is the second multi-faceted initiative that contributes to the 60% goal. As mentioned on page 4, the waste characterization study revealed that 45% of material in the brown garbage cart is actually organic materials, as shown on Graph 10.

1. Research cleaner and more efficient vehicle technologies. Convert all fleet passenger vehicles and small trucks to more efficient options by 2025 with a priority on electrification (page 5).
2. Maintain six hybrid diesel-electric trucks for the downtown collections routes (page 5).
3. Research technology and pilot electric heavy-duty trucks and electric heavy equipment to include technology to reduce emissions from current diesel vehicles (page 5).

Green Cart Program Tactics

As mentioned on page 4, the waste characterization study revealed that 45% of what customers throw away in their garbage cart is actually organic material. The composition was as follows:

Graph 10: Waste Study Results

Organics	45.1%		141,410
Edible Food	16.2%	<div></div>	50,795
Compostable/Food Soiled Paper	13.6%	<div></div>	42,486
Inedible Food	9.0%	<div></div>	28,313
Yard Debris	6.1%	<div></div>	19,032

Implement a Communications Plan Focused on Participation, Contamination and Diversion

1. Continue providing educational presentations on how to correctly sort household waste.
2. Clearly emphasize common organic materials generated at the household level through customer touch points such as cart lid stickers.
3. Continue to encourage the placement of yard debris in the green cart.



Strategies and Execution

4. Educate customers how to place food in their green cart, cleanly and safely.
5. Educate customers on contamination (page 15).

Secure Long-term Solutions for Processing and Distribution

1. Explore other opportunities for the contracted processing of organic material.
2. Secure partnerships with other City entities that would need compost, such as City parks.
3. Research alternate options for use of City compost. For example, Transportation and Capital Improvement's project specifications could include 'amended soil'.

Research Comparative Cities' Policies

1. Some municipalities have implemented bans on yard materials or food in the garbage cart. A similar ban in San Antonio could capture more of the recoverable material from the garbage.

Brown Cart Program Tactics (Cart Downsizing)

This program, introduced on page 9, is sometimes referred to as *Pay As You Throw* or variable rate pricing. It is the third in the group of programs designed to achieve the 60% recycling goal.

Continue Promoting Incentives and Benefits

1. Campaigns to include:
 - a. English/Spanish radio and TV commercials plus multi-language PSAs.
 - b. Billboard and VIA bus advertising.
 - c. Social media and digital campaigns.
 - d. Direct mail and other customer touch points.
2. Continue door-to-door outreach (Ground Game).
3. Use the SWMD mobile app Recycle Coach to push messaging out and to obtain feedback .

Conduct a Price Sensitivity Analysis

1. Estimate the impact rates have on customers' cart exchanges.
2. Predict the effects of those exchanges to recycling, organics and garbage tonnage.

